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SEQUENCE LISTING

<110> Harrington, et al.

<120> Mammalian Flap Specific-Endonuclease

<130> 9584-017

<140> 09/586,744

<141> 2000-06-02

<160> 74

<170> PatentIn version 3.0

<210> 1

<211> 380

<212> PRT

<213> Artificial

<220>

<223> Peptide

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Ile Asp Ala Ser Met Ser Ile Tyr Gln Phe Leu Ile Ala Val Arg Gln  
35 40 45

Gly Gly Asp Val Leu Gln Asn Glu Glu Gly Glu Thr Thr Ser His Leu  
50 55 60

Met	Gly	Met	Phe	Tyr	Arg	Thr	Ile	Arg	Met	Met	Glu	Asn	Gly	Ile	Lys	65	70	75	80
Pro	Val	Tyr	Val	Phe	Asp	Gly	Lys	Pro	Pro	Gln	Leu	Lys	Ser	Gly	Glu	85	90	95	
Leu	Ala	Lys	Arg	Ser	Glu	Arg	Arg	Ala	Glu	Ala	Glu	Lys	Gln	Leu	Gln	100	105	110	
Gln	Ala	Gln	Ala	Ala	Gly	Ala	Glu	Gly	Glu	Val	Glu	Lys	Phe	Thr	Lys	115	120	125	
Arg	Leu	Val	Lys	Val	Thr	Lys	Gln	His	Asn	Asp	Glu	Cys	Lys	His	Leu	130	135	140	
Leu	Ser	Leu	Met	Gly	Ile	Pro	Tyr	Leu	Asp	Ala	Pro	Ser	Glu	Ala	Glu	145	150	155	160
Ala	Ser	Cys	Ala	Ala	Leu	Val	Lys	Ala	Gly	Lys	Val	Tyr	Ala	Ala	Ala	165	170	175	
Thr	Glu	Asp	Met	Asp	Cys	Leu	Thr	Phe	Gly	Ser	Pro	Val	Leu	Met	Arg	180	185	190	
His	Leu	Thr	Ala	Ser	Glu	Ala	Lys	Lys	Leu	Pro	Ile	Gln	Glu	Phe	His	195	200	205	
Leu	Ser	Arg	Ile	Leu	Gln	Glu	Leu	Gly	Leu	Asn	Gln	Glu	Gln	Phe	Val	210	215	220	
Asp	Leu	Cys	Ile	Leu	Leu	Gly	Ser	Asp	Tyr	Cys	Glu	Ser	Ile	Arg	Gly	225	230	235	240
Ile	Gly	Pro	Lys	Arg	Ala	Val	Asp	Leu	Ile	Gln	Lys	His	Lys	Ser	Ile	245	250	255	
Glu	Glu	Ile	Val	Arg	Arg	Leu	Asp	Pro	Asn	Lys	Tyr	Pro	Val	Pro	Glu	260	265	270	
Asn	Trp	Leu	His	Lys	Glu	Ala	His	Gln	Leu	Phe	Leu	Glu	Pro	Glu	Val	275	280	285	
Leu	Asp	Pro	Glu	Ser	Val	Glu	Leu	Lys	Trp	Ser	Glu	Pro	Asn	Glu	Glu	290	295	300	
Glu	Leu	Ile	Lys	Phe	Met	Cys	Gly	Glu	Lys	Gln	Phe	Ser	Glu	Glu	Arg	305	310	315	320
Ile	Arg	Ser	Gly	Val	Lys	Arg	Leu	Ser	Lys	Ser	Arg	Gln	Gly	Ser	Thr	325	330	335	
Gln	Gly	Arg	Leu	Asp	Asp	Phe	Phe	Lys	Val	Thr	Gly	Ser	Leu	Ser	Ser	340	345	350	
Ala	Lys	Arg	Lys	Glu	Pro	Glu	Pro	Lys	Gly	Ser	Thr	Lys	Lys	Lys	Ala	355	360	365	

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<211> 1144

<212> DNA

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accagccacc tgatgggcat gttctaccgc accattcgca tgatggagaa cggcatcaag      240
cccgtgtatg tctttgatgg caagccgcca cagctcaagt caggcgagct ggccaaacgc      300
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Ile	Asp	Ala	Ser	Met	Ser	Ile	Tyr	Gln	Phe	Leu	Ile	Ala	Val	Arg	Gln	35	40	45	
Gly	Gly	Asp	Val	Leu	Gln	Asn	Glu	Glu	Gly	Glu	Thr	Thr	Ser	Leu	Met	50	55	60	
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Tyr	Val	Phe	Asp	Gly	Lys	Pro	Pro	Gln	Leu	Lys	Ser	Gly	Glu	Leu	Ala	85	90	95	
Lys	Arg	Ser	Glu	Arg	Arg	Ala	Glu	Ala	Glu	Lys	Gln	Leu	Gln	Gln	Ala	100	105	110	
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Lys	Val	Thr	Lys	Gln	His	Asn	Asp	Glu	Cys	Lys	His	Leu	Leu	Ser	Leu	130	135	140	
Met	Gly	Ile	Pro	Tyr	Leu	Asp	Ala	Pro	Ser	Glu	Ala	Glu	Ala	Ser	Cys	145	150	155	160
Ala	Ala	Leu	Ala	Lys	Ala	Gly	Lys	Val	Tyr	Ala	Ala	Ala	Thr	Glu	Asp	165	170	175	
Met	Asp	Cys	Leu	Thr	Phe	Gly	Ser	Pro	Val	Leu	Met	Arg	His	Leu	Thr	180	185	190	
Ala	Ser	Glu	Ala	Lys	Lys	Leu	Pro	Ile	Gln	Glu	Phe	His	Leu	Ser	Arg	195	200	205	
Val	Leu	Gln	Glu	Leu	Gly	Leu	Asn	Gln	Glu	Gln	Phe	Val	Asp	Leu	Cys	210	215	220	

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 225 230 235 240  
 Lys Arg Ala Val Asp Leu Ile Gln Lys His Lys Ser Ile Glu Glu Ile  
 245 250 255  
 Val Arg Arg Leu Asp Pro Ser Lys Tyr Pro Val Pro Glu Asn Trp Leu  
 260 265 270  
 His Lys Glu Ala Gln Gln Leu Phe Leu Glu Pro Glu Val Val Asp Pro  
 275 280 285  
 Glu Ser Val Glu Leu Lys Trp Ser Glu Pro Asn Glu Glu Glu Leu Val  
 290 295 300  
 Lys Phe Met Cys Gly Glu Lys Gln Phe Ser Glu Glu Arg Ile Arg Ser  
 305 310 315 320  
 Gly Val Lys Arg Leu Ser Lys Ser Arg Gln Gly Ser Thr Gln Gly Arg  
 325 330 335  
 Leu Asp Asp Phe Phe Lys Val Thr Gly Ser Leu Ser Ser Ala Lys Arg  
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<212> DNA

<213> Artificial

<220>

<223> cDNA

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 accagcctga tgggcatgtt atggcaaacc atccgcatgg agaatggcat caagcctgtg 240  
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caagtgatgt	tctgacagcc	tttctgaggc	aatcaattga	attgaggttt	tgggagaaga	1860
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<223> Peptide

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35 40 45  
Gln Asp Gly Gly Gln Leu Thr Asn Glu Ala Gly Glu Thr Thr Ser His  
50 55 60  
Leu Met Gly Met Phe Tyr Arg Thr Leu Arg Met Ile Asp Asn Gly Ile  
65 70 75 80  
Lys Pro Cys Tyr Val Phe Asp Gly Lys Pro Pro Asp Leu Lys Ser His  
85 90 95  
Glu Leu Thr Lys Arg Ser Ser Arg Arg Val Glu Thr Glu Lys Lys Leu  
100 105 110  
Ala Glu Ala Thr Thr Glu Leu Glu Lys Met Lys Gln Glu Arg Arg Leu  
115 120 125  
Val Lys Val Ser Lys Glu His Asn Glu Glu Ala Gln Lys Leu Leu Gly  
130 135 140  
Leu Met Gly Ile Pro Tyr Ile Ile Ala Pro Thr Glu Ala Glu Ala Gln  
145 150 155 160  
Cys Ala Glu Leu Ala Lys Lys Gly Lys Val Tyr Ala Ala Ala Ser Glu  
165 170 175  
Asp Met Asp Thr Leu Cys Tyr Arg Thr Pro Phe Leu Leu Arg His Leu  
180 185 190  
Thr Phe Ser Glu Ala Lys Lys Glu Pro Ile His Glu Ile Asp Thr Glu  
195 200 205  
Leu Val Leu Arg Gly Leu Asp Leu Thr Ile Glu Gln Phe Val Asp Leu  
210 215 220  
Cys Ile Met Leu Gly Cys Asp Tyr Cys Glu Ser Ile Arg Gly Val Gly  
225 230 235 240  
Pro Val Thr Ala Leu Lys Leu Ile Lys Thr His Gly Ser Ile Glu Lys

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Ile	Pro	Glu	Asp	Trp	Pro	Tyr	Lys	Gln	Ala	Arg	Met	Leu	Phe	Leu	Asp				
		275					280					285							
Pro	Glu	Val	Ile	Asp	Gly	Asn	Glu	Ile	Asn	Leu	Lys	Trp	Ser	Pro	Pro				
	290					295					300								
Lys	Glu	Lys	Glu	Leu	Ile	Glu	Tyr	Leu	Cys	Asp	Asp	Lys	Lys	Phe	Ser				
305					310					315					320				
Glu	Glu	Arg	Val	Lys	Ser	Gly	Ile	Ser	Arg	Leu	Lys	Lys	Gly	Leu	Lys				
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Ser	Gly	Ile	Gln	Gly	Arg	Leu	Asp	Gly	Phe	Phe	Gln	Val	Val	Pro	Lys				
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Thr	Lys	Glu	Gln	Leu	Ala	Ala	Ala	Ala	Lys	Arg	Ala	Gln	Glu	Asn	Lys				
	355						360					365							
Lys	Leu	Asn	Lys	Asn	Lys	Asn	Lys	Val	Thr	Lys	Gly	Arg	Arg						
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<223> cDNA

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acaacgtcac acttgatggg tatgttttat aggacactga gaatgattga taacggtatc	240
aagccttggt atgtcttcga cggcaaacct ccagctttga aatctcatga gttgacaaag	300
cggctctcaa gaagggtgga aacagaaaaa aaactggcag aggcaacaac agaattggaa	360
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tgtgctgagt tggcaaagaa gggaaagggtg tatgccgcag caagtgaaga tatggacaca	540



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<211> 386

<212> PRT

<213> Artificial

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<223> Peptide

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35          40          45
Ala Val Lys Asn Ser His Ile Thr Gly Phe Phe Arg Arg Ile Cys Lys
50          55          60
Leu Leu Tyr Phe Gly Ile Arg Pro Val Phe Val Phe Asp Gly Gly Val
65          70          75          80
Pro Val Leu Lys Arg Glu Thr Ile Arg Gln Arg Lys Glu Arg Arg Gln
85          90          95
Gly Lys Arg Glu Ser Ala Lys Ser Thr Ala Arg Lys Leu Gln Gln Gln

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Pro	Met	Glu	Ala	Glu	Gln	Cys	Ala	Glu	Leu	Leu	Gln	Leu	Asn	Leu	Val
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Asp	Gly	Ile	Ile	Thr	Asp	Asp	Ser	Asp	Val	Phe	Leu	Phe	Gly	Gly	Thr
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Lys	Ile	Tyr	Lys	Asn	Met	Phe	His	Glu	Lys	Asn	Tyr	Val	Glu	Phe	Tyr
			180					185					190		
Asp	Ala	Glu	Ser	Ser	Ile	Leu	Lys	Leu	Leu	Gly	Leu	Asp	Arg	Lys	Asn
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Lys	Gly	Met	Gly	Pro	Val	Ser	Ser	Ile	Glu	Val	Ile	Ala	Glu	Phe	Gly
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Val	Tyr	Asp	Ala	Tyr	Met	Arg	Pro	Glu	Val	Asp	His	Asp	Thr	Thr	Pro
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Phe	Val	Trp	Gly	Val	Pro	Asp	Leu	Asp	Met	Leu	Arg	Ser	Phe	Met	Lys
	305					310					315				320
Thr	Gln	Leu	Gly	Trp	Pro	His	Glu	Lys	Ser	Asp	Glu	Ile	Leu	Ile	Pro
			325						330					335	
Leu	Ile	Arg	Asp	Val	Asn	Lys	Arg	Lys	Lys	Lys	Gly	Lys	Gln	Lys	Arg
		340						345					350		
Ile	Asn	Glu	Phe	Phe	Pro	Arg	Glu	Tyr	Ile	Ser	Gly	Asp	Lys	Lys	Leu
	355						360					365			
Asn	Thr	Ser	Lys	Arg	Ile	Ser	Thr	Ala	Thr	Gly	Lys	Leu	Lys	Lys	Arg
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Lys	Met														
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agaatttgta agctattata ctttggcatt aggccggtat tcgtctttga tggtggtgtg      240
cccgatttga aaaggggaaac aatacggcag aggaaagaaa gaagacaggg aaaacgagag      300
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Met Glu Ile His  
1  
ggc ctt gcc aaa cta att gct gat gtg gcc ccc agt gcc atc cgt gag 163  
Gly Leu Ala Lys Leu Ile Ala Asp Val Ala Pro Ser Ala Ile Arg Glu  
5 10 15 20  
aat gac atc aag agc tac ttt ggt cgc aaa gtg gcc atc gat gcc tcc 211  
Asn Asp Ile Lys Ser Tyr Phe Gly Arg Lys Val Ala Ile Asp Ala Ser  
25 30 35  
atg agc atc tac cag ttc ctg att gct gtt cgt cag ggt ggg gat gtg 259  
Met Ser Ile Tyr Gln Phe Leu Ile Ala Val Arg Gln Gly Gly Asp Val  
40 45 50  
ctg cag aac gag gag ggt gag acc acc agc ctg atg ggc atg ttc tac 307  
Leu Gln Asn Glu Glu Gly Glu Thr Thr Ser Leu Met Gly Met Phe Tyr  
55 60 65  
cgt acc atg cgc atg gag aat ggc atc aag cct gtg tac gtc ttt gat 355  
Arg Thr Met Arg Met Glu Asn Gly Ile Lys Pro Val Tyr Val Phe Asp  
70 75 80  
ggc aaa cca cca cag ctg aag tca ggc gag ctg gcc aag cgc agt gag 403  
Gly Lys Pro Pro Gln Leu Lys Ser Gly Glu Leu Ala Lys Arg Ser Glu  
85 90 95 100  
agg cgc gcc gag gct gag aag caa ctg cag cag gct cag cag gct ggg 451  
Arg Arg Ala Glu Ala Glu Lys Gln Leu Gln Gln Ala Gln Gln Ala Gly  
105 110 115  
atg gag gag gag gtg gag aag ttc acc aag agg ctc gtg aag gtc acc 499  
Met Glu Glu Glu Val Glu Lys Phe Thr Lys Arg Leu Val Lys Val Thr  
120 125 130

aag caa cac aat gat gag tgc aaa cac ctg ctg agc ctc atg ggc atc Lys Gln His Asn Asp Glu Cys Lys His Leu Leu Ser Leu Met Gly Ile 135 140 145	547
cct tac ctt gat gca ccc agc gag gca gag gcc agc tgt gct gcc ctg Pro Tyr Leu Asp Ala Pro Ser Glu Ala Glu Ala Ser Cys Ala Ala Leu 150 155 160	595
gca aag gct ggc aaa gtc tat gct gcg gcc acg gag gac atg gac tgc Ala Lys Ala Gly Lys Val Tyr Ala Ala Ala Thr Glu Asp Met Asp Cys 165 170 175 180	643
ctc act ttt ggc agc ccc gtg cta atg cga cac tta act gcc agt gag Leu Thr Phe Gly Ser Pro Val Leu Met Arg His Leu Thr Ala Ser Glu 185 190 195	691
gcc aag aag ctg ccc atc caa gag ttc cat ctg agc cgc gtc ctg cag Ala Lys Lys Leu Pro Ile Gln Glu Phe His Leu Ser Arg Val Leu Gln 200 205 210	739
gag ctg ggt ctg aac cag gag cag ttt gtg gat ctg tgc atc ctg ctg Glu Leu Gly Leu Asn Gln Glu Gln Phe Val Asp Leu Cys Ile Leu Leu 215 220 225	787
ggt agc gac tac tgc gag agc atc cgt ggc att ggc gcc aag cgg gct Gly Ser Asp Tyr Cys Glu Ser Ile Arg Gly Ile Gly Ala Lys Arg Ala 230 235 240	835
gtg gat ctc atc cag aaa cat aag agc atc gag gag atc gtg agg cgg Val Asp Leu Ile Gln Lys His Lys Ser Ile Glu Glu Ile Val Arg Arg 245 250 255 260	883
ctg gac ccc agc aag tac ccc gtt cca gag aac tgg ctc cac aag gaa Leu Asp Pro Ser Lys Tyr Pro Val Pro Glu Asn Trp Leu His Lys Glu 265 270 275	931
gcc cag cag ctc ttc ctg gag cca gaa gta gtg gac cca gag tct gtg Ala Gln Gln Leu Phe Leu Glu Pro Glu Val Val Asp Pro Glu Ser Val 280 285 290	979
gag ctg aag tgg agc gag cca aat gaa gaa gag ttg gtc aaa ttt atg Glu Leu Lys Trp Ser Glu Pro Asn Glu Glu Glu Leu Val Lys Phe Met 295 300 305	1027
tgt ggt gaa aag cag ttt ttt gaa gag cga att cgc agt ggg gtc aag Cys Gly Glu Lys Gln Phe Phe Glu Glu Arg Ile Arg Ser Gly Val Lys 310 315 320	1075
cgg ctg agt aag agc cgc cag ggc agc acc cag gga cgc ctc gat gat Arg Leu Ser Lys Ser Arg Gln Gly Ser Thr Gln Gly Arg Leu Asp Asp 325 330 335 340	1123
ttc ttc aag gtg aca ggc tca ctc tcc tca gct aag cgc aag gag cca Phe Phe Lys Val Thr Gly Ser Leu Ser Ser Ala Lys Arg Lys Glu Pro 345 350 355	1171

gaa ccc aag ggg cct gct aag aag aaa gca aag act ggg gga gcg ggg 1219  
 Glu Pro Lys Gly Pro Ala Lys Lys Lys Ala Lys Thr Gly Gly Ala Gly  
           360                                  365                                  370

aag ttc cga agg gga aaa taaacctgtc cttccccctcc actgtccttg 1267  
 Lys Phe Arg Arg Gly Lys  
           375

accccagggt gtctatctgt tttgtaccct cggtgcagc acatccctct tgtccctcgt 1327

cttgaggaga gttcattgct tccagcgctg cccttcagag ctttccctct cttgaccctg 1387

tggcaggaag gccgtagctc tgctttttct catttttagc tcaggaaaga tgtcaggctc 1447

aaaccacttc tcagggtaat ggacactgta gtcattgttc tgtgcaactg cgagcaatgt 1507

cttaaggaag aagaagataa agccgggagc gaggtcggag atagtttccc agctggccag 1567

ctggtggagg agaggtgact agaacctgac tgactactgc tccttctaata ttcactgtcc 1627

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agagaagtct ggctgacaac agatttagta ctgaccagct gatttttgtg ggcagaaatt 1747

tgaacttgct gcctgctgag tccagtagtt gtgcaggagg tgagatggca gtgtttaagt 1807

tttgatttgt agttttttgt tttgtctct cccctctcca gtgttgggga ttgacccag 1867

ggcaaaggca ttaagtgtgc cactgacctg tgcctccaag tgatgttctg acagcctttc 1927

tgaggcaatc aattgaattg aggttttggg agaagaaact gttgttcata ggctatttct 1987

attttaaaag atgtgaagag aaaaaaaaaa caataaaatt ataaaa 2033

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<211> 378

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<213> Artificial

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Ala Ile Arg Glu Asn Asp Ile Lys Ser Tyr Phe Gly Arg Lys Val Ala  
           20                                  25                                  30

Ile Asp Ala Ser Met Ser Ile Tyr Gln Phe Leu Ile Ala Val Arg Gln  
 35 40 45  
 Gly Gly Asp Val Leu Gln Asn Glu Glu Gly Glu Thr Thr Ser Leu Met  
 50 55 60  
 Gly Met Phe Tyr Arg Thr Met Arg Met Glu Asn Gly Ile Lys Pro Val  
 65 70 75 80  
 Tyr Val Phe Asp Gly Lys Pro Pro Gln Leu Lys Ser Gly Glu Leu Ala  
 85 90 95  
 Lys Arg Ser Glu Arg Arg Ala Glu Ala Glu Lys Gln Leu Gln Gln Ala  
 100 105 110  
 Gln Gln Ala Gly Met Glu Glu Glu Val Glu Lys Phe Thr Lys Arg Leu  
 115 120 125  
 Val Lys Val Thr Lys Gln His Asn Asp Glu Cys Lys His Leu Leu Ser  
 130 135 140  
 Leu Met Gly Ile Pro Tyr Leu Asp Ala Pro Ser Glu Ala Glu Ala Ser  
 145 150 155 160  
 Cys Ala Ala Leu Ala Lys Ala Gly Lys Val Tyr Ala Ala Ala Thr Glu  
 165 170 175  
 Asp Met Asp Cys Leu Thr Phe Gly Ser Pro Val Leu Met Arg His Leu  
 180 185 190  
 Thr Ala Ser Glu Ala Lys Lys Leu Pro Ile Gln Glu Phe His Leu Ser  
 195 200 205  
 Arg Val Leu Gln Glu Leu Gly Leu Asn Gln Glu Gln Phe Val Asp Leu  
 210 215 220  
 Cys Ile Leu Leu Gly Ser Asp Tyr Cys Glu Ser Ile Arg Gly Ile Gly  
 225 230 235 240  
 Ala Lys Arg Ala Val Asp Leu Ile Gln Lys His Lys Ser Ile Glu Glu  
 245 250 255  
 Ile Val Arg Arg Leu Asp Pro Ser Lys Tyr Pro Val Pro Glu Asn Trp  
 260 265 270

Leu His Lys Glu Ala Gln Gln Leu Phe Leu Glu Pro Glu Val Val Asp  
 275 280 285

Pro Glu Ser Val Glu Leu Lys Trp Ser Glu Pro Asn Glu Glu Glu Leu  
 290 295 300

Val Lys Phe Met Cys Gly Glu Lys Gln Phe Phe Glu Glu Arg Ile Arg  
 305 310 315 320

Ser Gly Val Lys Arg Leu Ser Lys Ser Arg Gln Gly Ser Thr Gln Gly  
 325 330 335

Arg Leu Asp Asp Phe Phe Lys Val Thr Gly Ser Leu Ser Ser Ala Lys  
 340 345 350

Arg Lys Glu Pro Glu Pro Lys Gly Pro Ala Lys Lys Lys Ala Lys Thr  
 355 360 365

Gly Gly Ala Gly Lys Phe Arg Arg Gly Lys  
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<211> 30

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<213> Artificial

<220>

<223> Oligonucleotide

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30

<210> 12

<211> 13

<212> PRT

<213> Artificial

<220>



<223> Peptide

<400> 12

Gln Lys Arg Glu Ser Ala Lys Ser Thr Ala Arg Ala Arg  
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<210> 13

<211> 26

<212> DNA

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<220>

<223> Oligonucleotide

<400> 13

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26

<210> 14

<211> 28

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<213> Artificial

<220>

<223> Oligonucleotide

<400> 14

tttattttcc ccttttaaac ttccctgc

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<211> 22

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<213> Artificial

<220>

<223> Peptide

<400> 15

Ile Gln Gly Leu Ala Lys Leu Ile Ala Asp Val Ala Pro Ser Ala Ile  
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Arg Glu Asn Asp Ile Lys  
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<210> 16

<211> 16

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<213> Artificial

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<223> Peptide

<400> 16

Ser Met Ser Ile Tyr Gln Phe Leu Ile Ala Val Arg Gln Gly Gly Asp  
 1 5 10 15

<210> 17

<211> 22

<212> PRT

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<220>

<223> Peptide

<400> 17

Thr Ser His Leu Met Gly Met Phe Tyr Arg Thr Ile Arg Met Met Glu  
 1 5 10 15

Asn Gly Ile Lys Pro Val  
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<210> 18

<211> 24

<212> PRT

<213> Artificial

<220>

<223> Peptide

<400> 18

Gly Lys Pro Pro Gln Leu Lys Ser Gly Glu Leu Ala Lys Arg Ser Glu  
1 5 10 15

Arg Arg Ala Glu Ala Glu Lys Gln  
20

<210> 19

<211> 20

<212> PRT

<213> Artificial

<220>

<223> Peptide

<400> 19

Glu Gln Glu Val Glu Lys Phe Thr Lys Arg Leu Val Lys Val Thr Lys  
1 5 10 15

Gln His Asn Asp  
20

<210> 20

<211> 25

<212> PRT

<213> Artificial

<220>

<223> Peptide

<400> 20

Leu Leu Ser Leu Met Gly Ile Pro Tyr Leu Asp Ala Pro Ser Glu Ala  
1 5 10 15

Glu Ala Ser Cys Ala Ala Leu Val Lys  
20 25

<210> 21

<211> 23

<212> PRT

<213> Artificial

<220>

<223> Peptide

<400> 21

Leu Thr Phe Gly Ser Pro Val Leu Met Arg His Leu Thr Ala Ser Glu  
1 5 10 15

Ala Lys Lys Leu Pro Ile Gln  
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<210> 22

<211> 21

<212> PRT

<213> Artificial

<220>

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<400> 22

Ile Leu Gln Glu Leu Gly Leu Asn Gln Glu Gln Phe Val Asp Leu Cys  
1 5 10 15

Ile Leu Leu Gly Ser  
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<210> 23

<211> 24

<212> PRT

<213> Artificial

<220>

<223> Peptide

<400> 23

Arg Gly Ile Gly Pro Lys Arg Ala Val Asp Leu Ile Gln Lys His Lys  
1 5 10 15

Ser Ile Glu Glu Ile Val Arg Arg  
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<210> 24

<211> 20

<212> PRT

<213> Artificial

<220>

<223> Peptide

<400> 24

Pro Glu Asn Trp Leu His Lys Glu Ala His Gln Leu Phe Leu Glu Pro  
1 5 10 15

Glu Val Leu Asp  
20

<210> 25

<211> 22

<212> PRT

<213> Artificial

<220>

<223> Peptide

<400> 25

Trp Ser Glu Pro Asn Glu Glu Glu Leu Ile Lys Phe Met Cys Gly Glu  
1 5 10 15

Lys Gln Phe Ser Glu Glu  
20

<210> 26

<211> 22

<212> PRT

<213> Artificial

<220>

<223> Peptide

<400> 26

Ser Lys Ser Arg Gln Gly Ser Thr Gln Gly Arg Leu Asp Asp Phe Phe  
1 5 10 15

Lys Val Thr Gly Ser Leu  
20

<210> 27

<211> 16

<212> PRT

<213> Artificial

<220>

<223> Peptide

<400> 27

Lys Glu Pro Glu Pro Lys Gly Ser Thr Lys Lys Lys Ala Lys Thr Gly  
1 5 10 15

<210> 28

<211> 1144

<212> DNA

<213> Artificial

<220>

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cagttcctga ttgctgttcg ccagggtggg gatgtgctgc agaatgagga gggtgagacc 180  
accagccacc tgatgggcat gttctaccgc accattcgca tgatggagaa cggcatcaag 240  
cccgtgtatg tctttgatgg caagccgcca cagctcaagt caggcgagct ggccaaacgc 300  
agtgagcggc gggctgaggc agagaagcag ctgcagcagg ctgaggetgc tggggccgag 360  
caggaggtgg aaaaattcac taagcggctg gtgaagggtca ctaagcagca caatgatgag 420

tgcaaacatc tgctgagcct catgggcac ccttatcttg atgcacccag tgaggcagag	480
gccagctgtg ctgccctggg gaaggctggc aaagtctatg ctgcggctac cgaggacatg	540
gactgcctca ccttcggcag ccctgtgcta atgcgacacc tgactgccag tgaagccaaa	600
aagctgccaa tccaggaatt ccacctgagc cggattctgc aggagctggg cctgaaccag	660
gaacagtttg tggatctgtg catcctgcta ggcagtgact actgtgagag tatccggggg	720
attgggcca agcgggctgt ggacctcatc cagaagcaca agagcatcga ggagatcgtg	780
cggcgacttg accccaacaa gtacctgtg ccagaaaatt ggctccacaa ggaggctcac	840
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ccaaatgaag aagagctgat caagttcatg tgtggtgaaa agcagttctc tgaggagcga	960
atccgcagtg gggtaagag gctgagtaag agccgccaag gcagcaccca gggccgcctg	1020
gatgatttct tcaagggtgac cggctcactc tcttcagcta agcgcaagga gccagaacct	1080
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taaa	1144

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<213> Artificial

<220>

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<212> DNA

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<223> Oligonucleotide

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tgacatcaag agctactttg gccgtaaggt ggcca 35

<210> 31

<211> 37

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<213> Artificial

<220>

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<210> 32

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<210> 33

<211> 39

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<400> 33  
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<210> 34

<211> 41

<212> DNA

<213> Artificial

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<400> 34

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41

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<211> 32

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<400> 35

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32

<210> 36

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<400> 36

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35

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<400> 37

atgatgagtg caaacatctg ctgagcctca tg

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44

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<210> 43  
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<212> DNA

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<210> 47

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41

<210> 48

<211> 38

<212> DNA

<213> Artificial

<220>

<223> Oligonucleotide

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atccgcagtg gggcgaagag gctgagtaag agccgcca

38

<210> 49

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<212> DNA

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<223> Oligonucleotide

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34

<210> 56

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<400> 56  
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<210> 57

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<400> 57  
gtaggagatg tcccttgatg aattc 25

<210> 58

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cagcaacgca agcttg 16

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<400> 59  
tagcaggctg caggtcgac 19



<210> 60

<211> 30

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<400> 60

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33

<210> 63

<211> 19

<212> DNA

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<220>

<223> Oligonucleotide

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tgctagagat tttccacat

19

<210> 64

<211> 40

<212> DNA

<213> Artificial

<220>

<223> Polynucleotide

<400> 64

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40

<210> 65

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35

<210> 66

<211> 24

<212> DNA

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<223> Polynucleotide

<400> 66

gtaggagatg tcccttgatg aatt

24

<210> 67

<211> 24

<212> DNA

<213> Artificial

<220>

<223> Polynucleotide

<400> 67

gtaggagatg tcccttgatg attc

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gtaggagatg tcccttgatg

20

<210> 69

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40

<210> 74

<211> 19

<212> DNA

<213> Artificial

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19